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US 4225147 US 3794351

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## (54) Vehicle with spherical wheels

(57) A vehicle (2) comprises a body (4), spherical wheels (6), and steering apparatus (8), and may be in the form of a bicycle or tricycle. The vehicle may be pedal or motor petrol, diesel or electric driven, or may be propelled by the feet. Specific uses include golf buggies, childrens amusement vehicles, vehicles for use on sand dunes, and "fun" vehicles.

Two or more vehicles may be connected together by peg and slot members 36, 38.

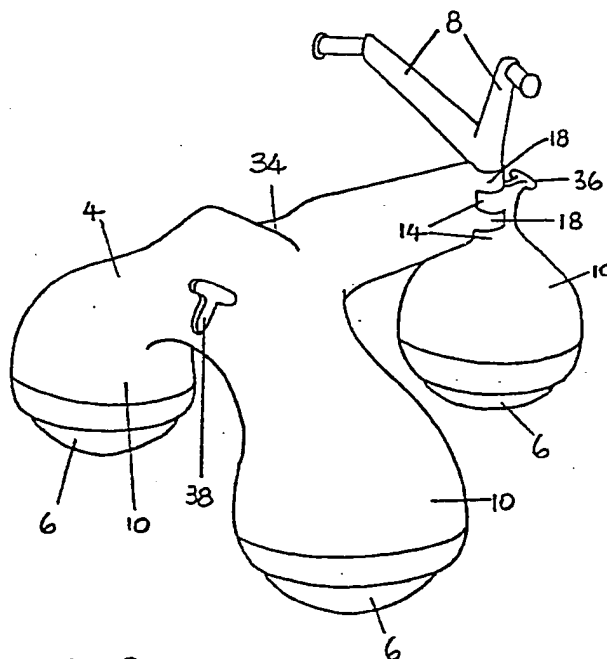
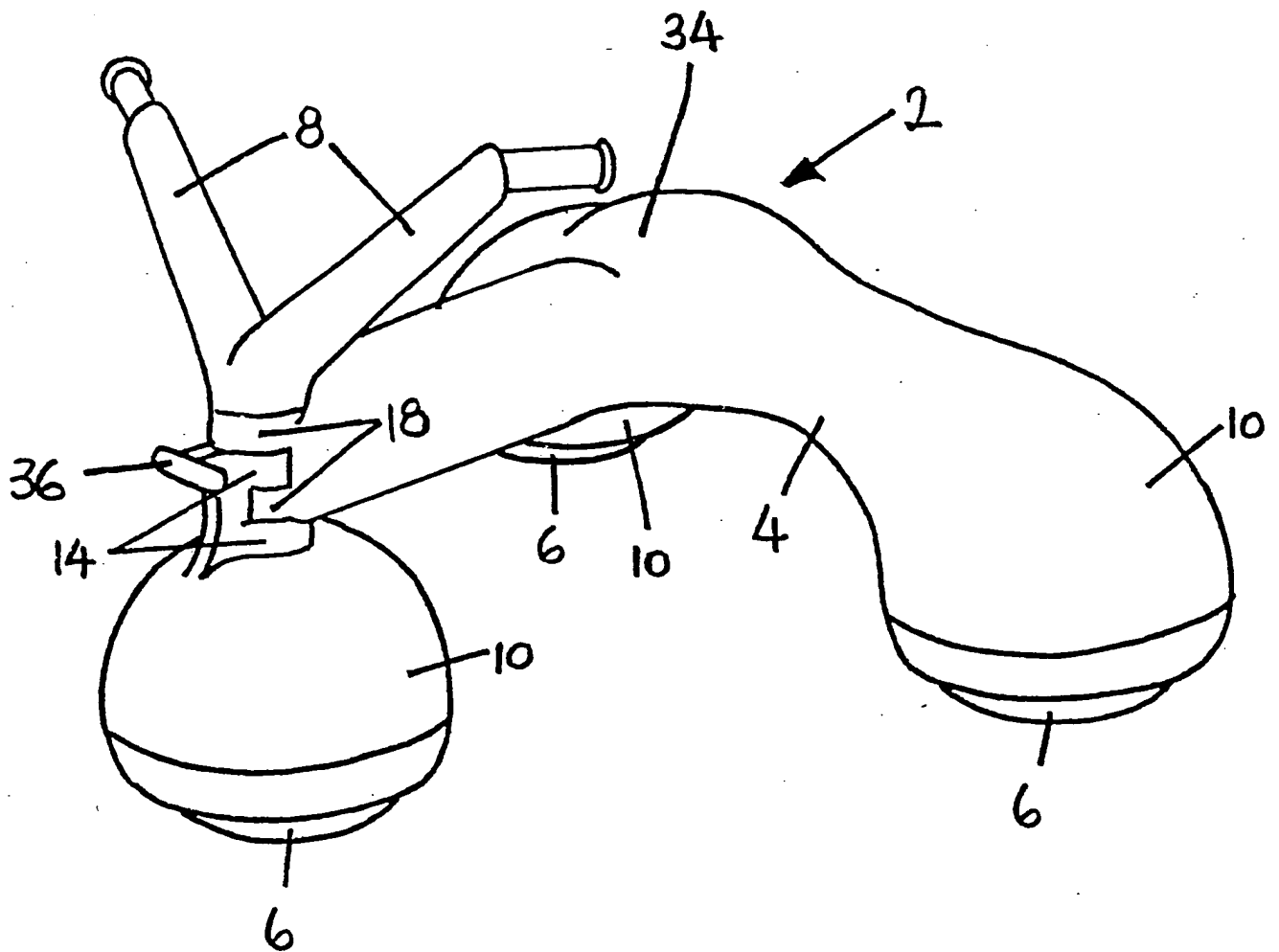
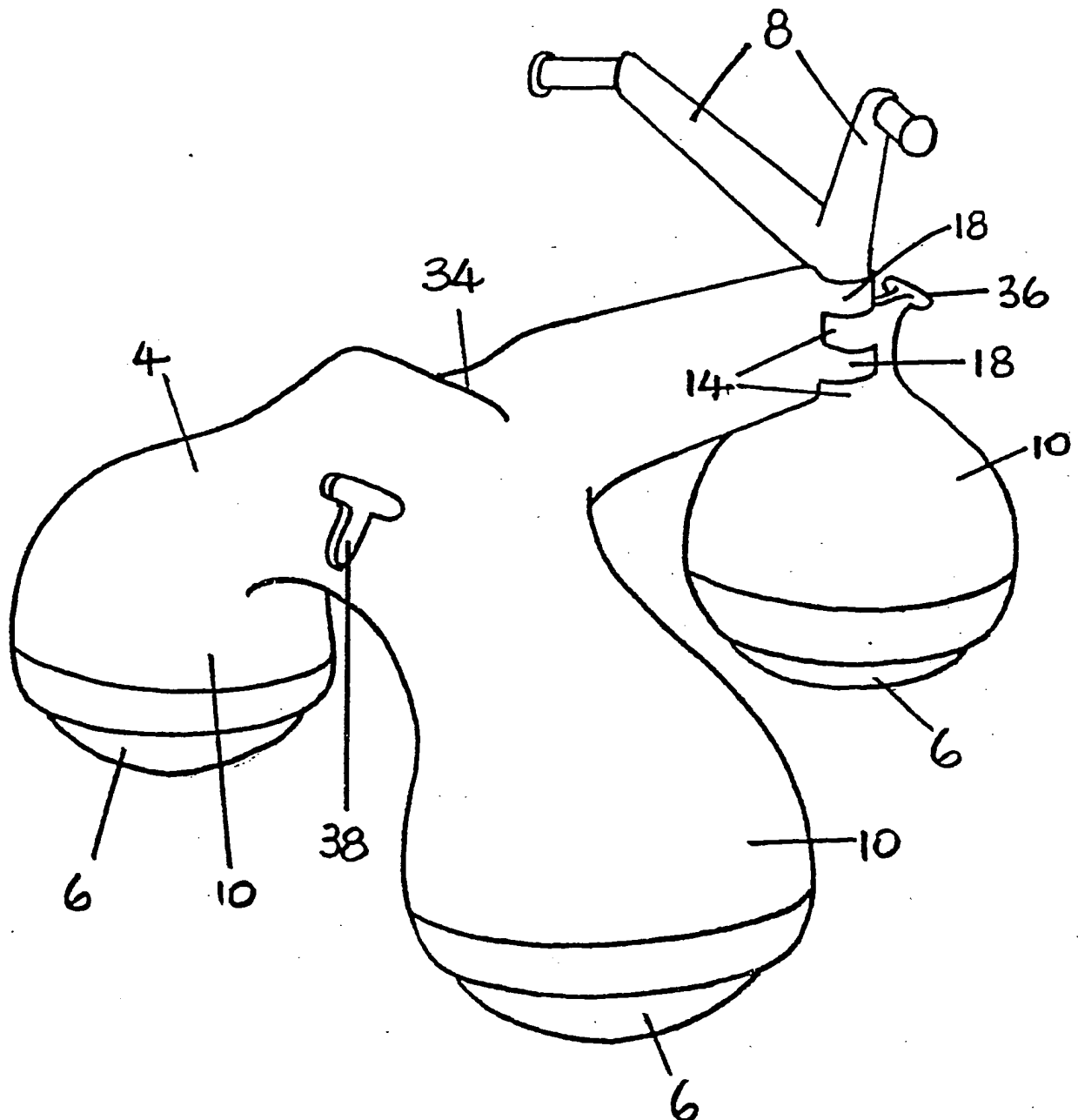


FIG 2

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FIG 1

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FIG 2

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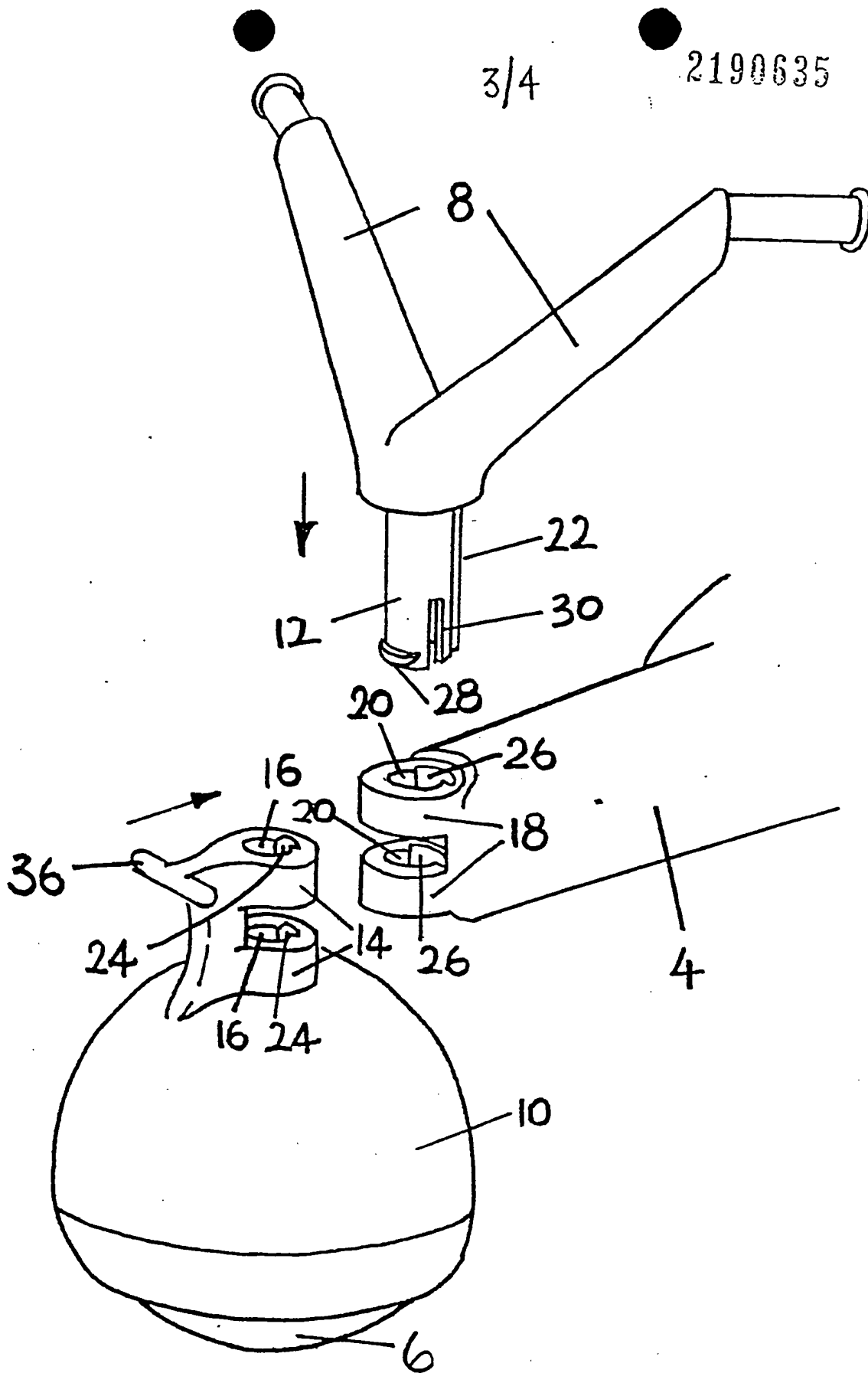


FIG 3

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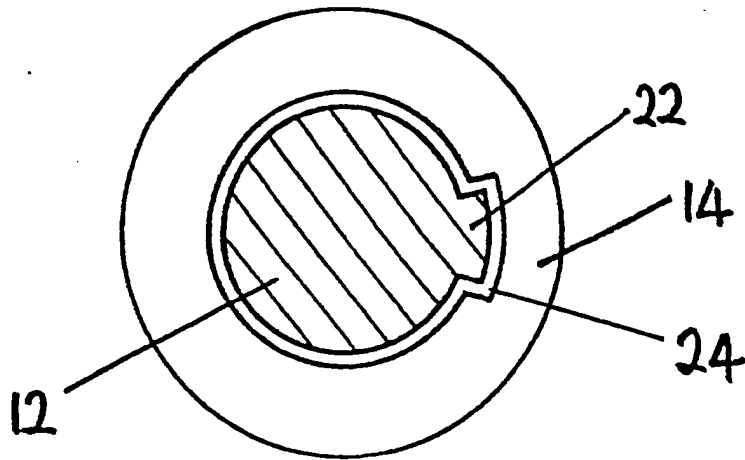
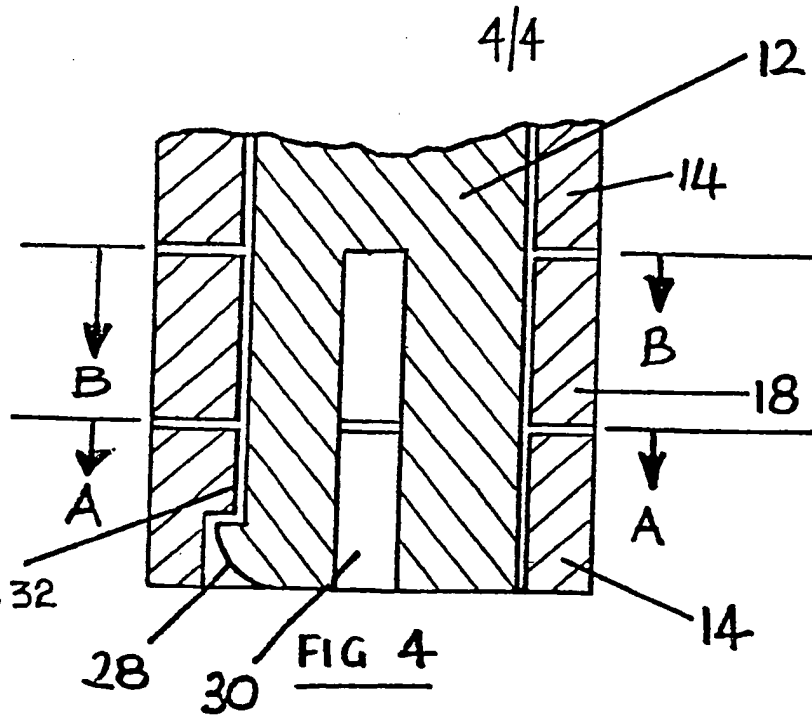


FIG 5

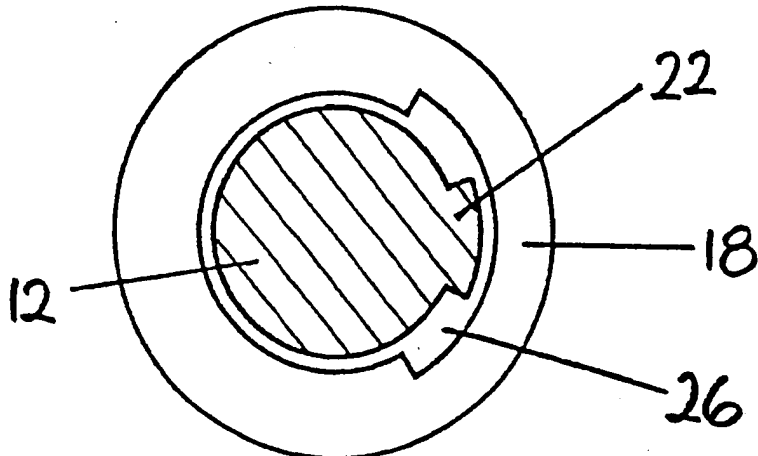


FIG 6

## SPECIFICATION

## A vehicle

5 This invention relates to a vehicle.

More specifically, this invention provides a vehicle comprising a body, wheels and steering apparatus, the wheels being in the form of spheres.

The vehicle can be any desired and appropriate type of vehicle. Thus, the vehicle may be a velociped such for example as tricycle or a bicycle. For very young children the tricycle or bicycle may not have any pedals so that it will be moved by the rider pushing against the ground with is or her feet. If desired, the velociped may be provided with pedals. Generally, the vehicle may be any two, three or four wheeled vehicle and, if desired, it may be provided with an engine. The engine may be petrol or diesel driven and the engine may be a two stroke engine or a four stroke engine. The vehicle may also be battery operated via an electric motor. Such powered vehicles may be used as buggies for use on golf courses and similar places, or for use as fun vehicles, for example on sand dunes.

25 The vehicle may be one in which the body has a concave wheel housing for each wheel, each concave wheel housing being such that it extends downwardly over the top of its wheel to cover more than half of the wheel.

30 Each wheel may be rotatably pivoted on an axle arrangement secured to its concave wheel housing. Each wheel housing may comprise a single shaft extending through the wheel. Alternatively, each axle arrangement may comprise a pair of shafts which extend towards each other to engage the wheel from opposite sides of the wheel.

The steering apparatus may be in the form of a pair of handle bars. Alternatively, the steering apparatus may be in the form of a steering wheel.

40 The steering apparatus may be linked to a front wheel of the vehicle through a shaft which connects to the concave wheel housing for the front wheel, the concave wheel housing for the front wheel being separately formed from the remainder of the body of the vehicle such that the concave wheel housing for the front wheel is pivotable with respect to the remainder of the body of the vehicle.

The concave wheel housing for the front wheel may be formed with a pair of apertured finger devices which receive a pair of apertured finger devices on the remainder of the body of the vehicle, the shaft passing through the apertures in both pairs of the apertured finger devices when both pairs of the apertured finger devices are brought together with their apertures in registry, the shaft being keyed to the pair of apertured finger devices of the concave wheel housing for the front wheel so that rotation of the shaft causes rotation of the concave wheel housing and its front wheel, and the shaft clipping under the pair of apertured finger devices of the concave wheel housing for the front wheel in order to retain the shaft in position.

The body is preferably a moulded plastics material body.

65 A presently preferred plastics material is

polypropylene but other plastics materials may be employed if desired.

The body may also be made from a metal if desired. Where the body is moulded from a plastics material, then the body is preferably blow moulded, although other moulding techniques may be employed.

Advantageously, the vehicle includes a seat which is formed as an integral moulded part of the body.

75 The seat may, if desired, be formed as a separate part of the vehicle, in which case it may be stuck, screwed or otherwise fixed to the body of the vehicle.

The vehicle may include front and rear connection devices for connecting the vehicles together one after another.

Preferably, the front connection device is a male connection device, and the rear connection device is a female connection device.

85 Preferably, the male connection device is a T-shaped bar, and the female connection device is a complementary T-shaped recess.

The rear connector device may also be used for receiving a trailer having a front connection device.

An embodiment of the invention will now be described solely by way of example and with reference to the accompanying in which:

*Figure 1* is a front perspective view of a vehicle;

*Figure 2* is a rear perspective view of the vehicle shown in *Figure 1*;

95 *Figure 3* is an exploded view of the front part of the vehicle;

*Figure 4* is a section through the steering linkage part of the vehicle shown in *Figure 3*;

*Figure 5* is a section on the line AA shown in *Figure 4*; and

*Figure 6* is a section on the line BB shown in *Figure 4*.

Referring to the drawings, there is shown a vehicle 2 comprising a body 4, wheels 6, and steering apparatus in the form of a pair of handle bars 8.

The wheels 6 are in the form of spheres as shown. The body 4 has a concave wheel housing 10 for each wheel. Each concave wheel housing is such that it extends downwardly as shown over the top of its wheel 6 to cover more than half of the wheel 6.

110 Each wheel 6 is rotatably pivoted on an axle arrangement (not shown) secured to its concave wheel housing. The axle arrangement comprises a single shaft (not shown) extending through the wheel 6.

115 As shown most clearly in *Figures 3* to *6*, the handle bars 8 are linked to the front wheel 6 of the vehicle 3 through a shaft 12. The shaft 12 connects to the concave wheel housing 10 for the front wheel 6. As shown in *Figure 3*, the concave wheel housing 10 for the front wheel 6 is separately formed from the remainder of the body 4 of the vehicle 2 such that the concave wheel housing 10 for the front wheel 6 is pivotable with respect to the remainder of the body 4 of the vehicle 2.

120 As can be clearly seen from *Figure 3*, the concave wheel housing 10 for the front wheel 6 is formed with a pair of apertured finger devices 14 which are each provided with an aperture 16. The remainder of the body 4 of the vehicle 2 is also provided with a pair of

apertured finger devices 18 which are each provided with an aperture 20. The shaft 12 passes through the apertures 16, 20 in both pairs of the apertured finger devices 14, 18 when both pairs of the apertured

5 finger devices 14, 18 are brought together with their apertures 16, 20 in registry.  
As shown most clearly in Figures 5 and 6, the shaft 12 is provided with a longitudinally extending key 22. The apertures 16 extend into a key way 24, whilst the  
10 apertures 20 extend into a key way 26. As can be seen from Figures 5 and 6, the key 22 is a relatively close fit in the key way 24, and the key way 26 is approximately three times larger than the key way 24. This means that when the shaft 12 is in position in  
15 the apertures 16, 20 the key 22 is a tight fit in the key ways 24 so that rotation of the shaft 12 via the handle bars 8 will cause the concave wheel housing 10 to rotate and therefore also the front wheel 6 inside the concave wheel housing 10. As can be seen from  
20 Figure 3, the pair of apertured finger devices 14 are formed as a moulded extension portion on top of the concave wheel housing 10. Since the apertured finger devices 18 will not be rotating, it is essential to allow the shaft 12 to rotate in the apertures 20. This is  
25 allowed due to the large size of the key ways 26 which do not interfere with the key 22 as it moves backwards and forwards consequent upon rotation of the shaft 12.

The shaft 12 is provided with a clip portion 28 at its  
30 lower end shown in Figures 3 and 4. The lower end of the shaft 12 is also provided with a slot 30. Since the shaft 12 is formed as a hollow tube, it will be apparent that the slot 30 enables the two parts of the shaft 12 on either side of the slot 30 to be pushed  
35 together as the shaft 12 with its clip portion 28 is pushed down through the apertures 16, 20. When the shaft 12 reaches its bottom position, the resilience of the material from which the shaft 12 is made causes the bottom of the shaft 12 to resume its normal  
40 diameter and the clip portion 28 clips under a shoulder 32 formed in the lowermost apertured finger device 44 as shown in Figure 4. Thus the shaft 12 cannot be removed from the apertures 16, 20 simply by pulling upwardly on the handle bars 8 and  
45 it is first necessary to lever the clip 28 inwardly partially to close the slot 30 and release the clip portion 28 from locking engagement with the shoulder 32.

The body 4 is blow moulded from polypropylene  
50 plastics material. The body 4 is such that it is provided with an integrally moulded seat 34.

The vehicle 2 includes front and rear connection devices for connecting the vehicles 2 together one after another. More specifically, the front connection  
55 device is a male connection device in the form of a T-shaped bar 36, whilst the rear connection device is a female connection device in the form of a complementary T-shaped recess 38. The T-shape bar 36 is able to fit into a T-shaped recess 38 and slide to  
60 the bottom of the T-shaped recess 38 to lock the vehicles together as will be readily understood. Instead of locking two vehicles together, the T-shaped recess 38 can receive a trailer (not shown) having a front connection device in the form of the

It is to be appreciated that the embodiment of the invention described above with reference to the accompanying drawings has been given by way of example only and that modifications may be  
70 effected. Thus, for example, the vehicle 2 shown in the drawings is a three wheeled vehicle which is intended for young children and, as such, has not been provided with pedals. For older children, the vehicle 2 could be provided with pedals. The vehicle  
75 2 could be made in a larger version and provided with an internal combustion engine or an electric motor and then used as a buggy, for example for use on golf courses or for use as a pleasure/fun vehicle. Obviously, with the vehicles having pedals, an  
80 engine or an electric motor, then appropriate brakes and other devices such for example as lights may be provided. As an alternative to employing an axle arrangement comprising a single shaft, the axle arrangement may comprise a pair of shafts which  
85 extend towards each other to engage the wheel from opposite sides of the wheel.

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## CLAIMS

- 90 1. A vehicle comprising a body, wheels and steering apparatus, the wheels being in the form of spheres.
2. A vehicle according to claim 1 and which is a velociped.
- 95 3. A vehicle according to claim 2 in which the velociped is a tricycle or a bicycle.
4. A vehicle according to claim 2 or claim 3 in which the vehicle does not have any pedals and in which the vehicle is moved by the rider pushing  
100 against the ground with his or her feet.
5. A vehicle according to claim 1 and which is provided with an engine.
6. A vehicle according to any one of the preceding claims in which the body has a concave  
105 wheel housing for each wheel, each concave wheel housing being such that it extends downwardly over the top of its wheel to cover more than half of the wheel.
7. A vehicle according to claim 6 in which each  
110 wheel is rotatable on an axle arrangement secured to its concave wheel housing.
8. A vehicle according to claim 7 in which each wheel housing comprises a single shaft extending through the wheel.
- 115 9. A vehicle according to claim 7 in which each axle arrangement comprises a pair of shafts which extend towards each other to engage the wheel from opposite sides of the wheel.
10. A vehicle according to any one of the  
120 preceding claims in which the steering apparatus is in the form of a pair of handle bars.
11. A vehicle according to any one of claims 1 to 9 in which the steering apparatus is in the form of a steering wheel.
- 125 12. A vehicle according to claim 6 or to claim 6 and any claim when appendant to claim 6 in which the steering apparatus is linked to a front wheel of the vehicle through a shaft which connects to the concave wheel housing for the front wheel, the

separately formed from the remainder of the body of the vehicle such that the concave wheel housing for the front wheel is pivotable with respect to the remainder of the body of the vehicle.

- 5 13. A vehicle according to claim 12 in which the concave wheel housing for the front wheel is formed with a pair of apertured finger devices which receive a pair of apertured finger devices on the remainder of the body of the vehicle, the shaft passing through the  
10 apertures in both pairs of the apertured finger devices when both pairs of the apertured finger devices are brought together with their apertures in registry, the shaft being keyed to the pair of apertured finger devices of the concave wheel  
15 housing for the front wheel so that rotation of the shaft causes rotation of the concave wheel housing and its front wheel, and the shaft clipping under the pair of apertured finger devices of the concave wheel housing for the front wheel in order to retain the  
20 shaft in position.

14. A vehicle according to any one of the preceding claims in which the body is a moulded plastics material body.

15. A vehicle according to any one of the  
25 preceding claims and including a seat which is formed as an integral moulded part of the body.

16. A vehicle according to any one of the preceding claims including front and rear connection devices for connecting the vehicles together one  
30 after another.

17. A vehicle according to claim 16 in which the front connection device is a male connection device, and the rear connection device is a female connection device.

- 35 18. A vehicle according to claim 17 in which the male connection device is a T-shaped bar, and the female connection device is a complementary T-shaped recess.

19. A vehicle substantially as herein described  
40 with reference to the accompanying drawings.